

CLAIMS

We claim:

1. A method, comprising the steps of:

determining a soft decision metric at a receiver for a plurality of symbols  
transmitted over a communication channel; and

employing the soft decision metric to determine symbol or bit error  
probability.

2. The method of claim 1, wherein the step of determining the soft decision metric for a  
plurality of symbols comprises the steps of:

observing the output of the communication channel; and

determining a derived probability for each one of the plurality of transmitted  
symbols through employment of a set of observations at the output of the  
communication channel.

3. The method of claim 1, further comprising the step of deriving an error rate estimate  
as a moving average of the symbol or bit error probability.

4. The method of claim 3, further comprising the step of employing the error rate  
estimate in providing feedback to a transmitter.

5. The method of claim 1, wherein the step of determining the soft decision metric for  
the plurality of symbols comprises the step of deriving the soft decision metric from an  
output of at least one of an equalizer and a demodulator.

6. The method of claim 5, wherein the output of the equalizer or demodulator comprises  
a log likelihood ratio.

7. The method of claim 1 wherein the transmitted symbols comprise binary values.

8. The method of claim 1, further comprising the step of employing the symbol or bit error probability to select a communication protocol.

9. The method of claim 8, wherein the step of employing the symbol or bit error probability to select a communication protocol is performed at the transmitter.

10. The method of claim 8, wherein the step of employing the symbol or bit error probability to select a communication protocol is performed at the receiver.

11. The method of claim 8, wherein the step of employing the symbol or bit error probability to select the communication protocol comprises the step of selecting at least one of a modulation scheme, a coding scheme, symbol rate, and power level.

12. The method of claim 8, wherein the step of employing the symbol or bit error probability to select a communication protocol comprises the step of comparing the symbol error probability to one or more predetermined thresholds.

13. A system comprising:

a transmitter that transmits a plurality of symbols over a communication channel;

a receiver that receives a plurality of symbols over the communication channel;

a decision device that provides a plurality of soft decision metrics for a plurality of symbols received over the communication channel;

a processor that obtains an error rate estimate through employment of symbol or bit error probability values computed from the soft decision metrics.

14. The system of claim 13, further comprising a feedback link that communicates an error rate estimate from the receiver to the transmitter.

15. The system of claim 14, further comprising a selector circuit that changes a communication protocol in response to the error rate estimate.

16. The system of claim 13, further comprising a selector that changes one or more of a modulation and coding scheme in response to the error rate estimate.

5 17. The system of claim 13 wherein the decision device comprises one or more of a demodulator and an equalizer.

18. The system of claim 13 wherein the decision device performs demodulation through employment of a Viterbi decoder algorithm or a variant thereof.

10 19. The system of claim 13 wherein the decision device performs equalization through employment of one or more of a Bahl-Cocke-Jelinek-Raviv algorithm, a soft output Viterbi algorithm, or variants thereof.

20. An article, comprising:

a computer-readable signal-bearing medium;

15 means in the medium for determining a soft decision metric at a receiver for a plurality of symbols transmitted over a communication channel; and

means in the medium for employing the soft decision metric to determine symbol or bit error probability.

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